

Summer Study Program in Belize, Central America
Cell Biology in Belize
University of Rhode Island
July 21st through August 15th 2008
MIC 491 Research in Microbiology
Syllabus

Program Director:

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Belize

The tropical country of Belize is located on the east coast of the Caribbean Sea. Belize possesses lush rainforests, mangrove swamps, and coral reef ecosystems. All are rich with a diversity of living organisms and offer the opportunity for biological exploration into the world comprising the kingdom Protista. Belize is also rich in history with a culture that dates back to the civilization of the Maya. In this rich biological and cultural setting, we will investigate and document single celled eukaryotic organisms and their unique niches while we experience a unique cultural journey.

Academic Program:

This program in tropical cell biology is targeted toward undergraduate and graduate students who desire an expedition-like experience, can use a microscope, enjoy working as part of a team, wish to grow culturally, can work in the heat, and still be happy when wet. This microbiology course offers students the opportunity for directed study of timeless organisms in a primeval setting far from the stresses of contemporary high tech society. This course is open to students in disciplines other than the biological sciences. Projects can be designed in ecology, biological illustration, photography, and journalism (contact the instructor for details).

Seminar and Labs (Monday-Friday):

The morning lectures will introduce students to the assemblage of organisms currently sequestered in the kingdom Protista. Unique aspects of their biology will be presented and discussed. In addition to organismal and cell biology, the morning lectures will include instruction in techniques for collecting, isolating, and maintaining cultures of select protists.

The central theme of the course will revolve around the evolutionary pathway to multicellularity vs. the pathway leading to the cellular complexities found in the organisms of the Protistan kingdom. There will be writing assignments each week that reflect the central theme of the course by addressing a specific evolutionary question.

Afternoon laboratories will be used for observation, isolation, and culture of organisms collected on field trips. Digital images obtained with the aid of compound and stereo microscopes will be used to document findings. Expeditions on one or more days each week will be used for sample collection. Some time will be devoted to visit sites of historical interest.

Methodological Approach:

Lecture materials and discussions will unify an underlying evolutionary theme based on the rise of multicellularity vs. the pathway to more complex cells.

DAILY SCHEDULE

In general, one or two days a week will be devoted to field collection. Time will be set aside to visit the Barton Creek Caves (the site of Maya burials) and also to experience extant Maya monuments. A coastal collection trip is planned.

Classes:

All classes will be held from 9:00 AM until 11:30 AM, with an hour and half lunch break. Afternoon labs will begin at 1:00 PM and conclude at 4:00 PM. All classes, laboratories, and discussions are mandatory. In addition to written assignments, students will be graded on their participation and progress in the afternoon laboratory sessions. During the laboratory periods students will work in teams (to be assigned by the instructor). Each team will be assigned a specific group of organisms to investigate and document (amoebae, flagellates, ciliates, diatoms, chytrids, and desmids are a few of many possibilities). The final choice of study organisms will be determined by our sample results. At least two evening discussion periods will be scheduled during the Belize experience. These are mandatory. Weekly assignments will be given at Monday morning lectures.

Week One:

The morning of our first day will be used as an orientation to the resort. In the afternoon we will have an introduction to the kingdom Protista and discuss the goals and theme of the course. Tuesday will be our first collection day. Collection sites will be determined following a preliminary trip in March by the instructor to areas of interest in the region. Wednesday through Friday we will have morning lectures and afternoon laboratories. On Saturday morning we will enjoy a brief discussion regarding the writing assignment.

Week Two:

This week we will continue with morning lectures and afternoon labs. On Thursday we will stop to assess our documentation process and plan for the last week. Teams will present documentation of their work to date and suggest a plan of action for the final week.

Week Three:

This week we will continue with morning lectures and afternoon labs.

The schedule will be determined by our progress in documenting our findings.

Thursday afternoon and Friday we will consolidate our work and prepare for our journey home.

Assignment requirements:

Paper will be provided for all assignments. Written assignments will be done in long hand or printed. Neatness (penmanship) will play a role in the grading process. Details of each assignment will be provided via handouts. Each student will maintain a detailed notebook. Grammar and spelling will also be considered in the grading process. All assignments will be due on Sundays by 4:00 PM (NO EXCEPTIONS).